What is claimed is:

1. A tunable optical device comprising one or more filters, wherein at least one filter comprises (a) one or more elastimers and (b) one or more gratings.

2. The tunable optical device of claim 1, wherein at least one grating is within the filter.

3. The tunable optical device of claim 1, wherein at least one filter is in a shape selected from the group consisting of a film, a cube, a waveguide, a fiber and a combination thereof.

4. The tunable optical device of claim 1, wherein two or more filters are stacked together.

5. The tunable optical device of claim 1, wherein at least one elastimer is an electroactive polymer and/or an electrostrictive polymer.

6. The tunable optical device of claim 1, wherein at least one elastimer has a change in thickness of at least about 1 percent by the application of 1 volt across a 1 mm thick film of the elastimer.

7. The tunable optical device of claim 6, wherein the change in thickness is within the range of about X percent to about Y percent, wherein X is selected from the

group consisting of 1, 2, 5, 10, 15, 25, 50 and 100, and wherein Y is selected from the group consisting of 25, 50, 100, 200, 400, 600, 800 and 1,000.

8. The tunable optical device of claim 1, comprising a stack of filters each independently controlled.

9. The tunable optical device of claim 1, wherein the filter has an isotropic expansion in a thickness direction.

10. The tunable optical device of claim 1, wherein the filter has an isotropic expansion in a direction transverse to the thickness direction of the filter.

11. The tunable optical device of claim 1, wherein at least one elastimer is a polar polymer and/or a non polar polymer.

12. The tunable optical device of claim 11, wherein the polar polymer and/or the non polar polymer comprises a moiety selected from the group consisting of poly(vinylidene fluoride), poly (methyl methacryayte), an odd numbered nylon, a polyurethane, an acrylate polymer, a ferroelectric polymers, and a combination thereof.

13. The tunable optical device of claim 1, wherein the filter further comprises one or more photoactive materials.

14. The tunable optical device of claim 13, wherein at least one photoactive material is a monomer and/or a sensitizer.

15. The tunable optical device of claim 14, wherein the monomer is selected from the group consisting of an acrylate, a methacrylate, an acrylamide, a methacrylamide, styrene, a substituted styrene, a vinyl naphthalene, a substituted vinyl naphthalene, a vinyl derivative, a vinyl ether, a maleate, a thiol, an olefin, an alkenyl ether, an allene ether, a ketene acetal, an epoxy and a combination thereof.

16. The tunable optical device of claim 14, wherein the sensitizer is selected from the group consisting of bis(η-5-2,4-cyclopentadien-1-yl)bis[2,6-difluoro-3-(1H-pyrrol-1-yl)phenyl]titanium, 5,7,diiodo-3-butoxy-6-fluorone, eosin, rose bengal, erythrosine, methylene blue, n-methyl diethanol amine, a sulfonium salt or an iodonium salt, (η_5-2,4-cyclopentadien-1-yl) (η_6-isopropylbenzene)-iron(II) hexafluorophosphate, and a combination thereof.

17. A method for manufacturing a tunable optical device, comprising:

forming a filter material comprising one or more elastimers and one or more photoactive materials, and

forming one or more gratings in the filter material.

18. The method of claim 17, wherein the forming a filter material comprises:

mixing at least one elastimer and at least one photoactive material to form a mixture and

molding the mixture to form the filter material comprising the at least one elastimer as a matrix phase and the at least one photoactive material as a dispersed phase.

19. The method of claim 17, wherein the forming a filter material comprises:

mixing a precursor for at least one elastimer and at least one photoactive material to form a mixture, and

curing the mixture to form the at least one elastimer.

20. The method of claim 17, wherein at least one grating is formed by photoinitiated polymerization of at least one photoactive material dispersed inside at least one elastimer.

21. The method of claim 17, wherein an index profile is recorded with a mask.

22. A method of adding or dropping one or more channels in a wavelength division multiplexing communication system, comprising:

illuminating multiple channels on one or more filters,

expanding or contracting the one or more filters and

adding or dropping one or more channels to or from the multiple channels

wherein at least one filter comprises (a) one or more elastimers and (b) one or more gratings.

23. The method of claim 22, wherein the expanding or contracting the one or more filters is done without relying on temperature or strain as a control signal for expanding or contracting the filter.

24. The method of claim 22, wherein at least one filter operates in a reflection mode, a transmission mode or a combination thereof.

25. The method of claim 22, wherein at least one grating is unslanted or slanted to a surface of the filter.

26. The method of claim 22, wherein at least one channel comprises light.

27. The method of claim 22, wherein two or more channels are added or dropped simultaneously or independently.

28. The method of claim 22, wherein at least one filter is a film having a thickness from 5 micron to 5 millimeters.

29. The method of claim 22, wherein at least one grating has periods between 0.1 micron and 500 microns.

30. The method of claim 22, wherein at least one filter has a tuning range between 1 to 700 nm.

31. The method of claim 22, wherein at least one filter has a tuning range between 1.3 and 1.6 nm.

32. The method of claim 22, wherein at least one grating has a slant angle to a surface of at least one filter of at least 5 degrees.

33. The method of claim 22, wherein at least one filter provides tunable attenuation of at least one channel.

34. The method of claim 22, wherein the filters are stacked and provide channel by channel attenuation of the multiple channels.